

Unit 9 Day 5 Review

p 159: 39-50
p 342: 73-76

$$(39) \frac{2}{p} - \frac{4}{3p} = 8 + \frac{3}{p} \quad p \neq 0$$

$$6 - 4 = 24p + 9$$

$$-7 = 24p$$

$$p = -\frac{7}{24}$$

$$(40) \left[2 - \frac{5}{p} = \frac{3}{p^2} \right] p^2$$

$$2p^2 - 5p = 3 \quad p \neq 0$$

$$2p^2 - 5p - 3 = 0$$

$$(2p + 1)(p - 3) = 0$$

$$p = -\frac{1}{2} \quad p = 3$$

$$\left\{ -\frac{1}{2}, 3 \right\}$$

$$(41) \frac{10}{4z-4} = \frac{1}{1-z} \quad z \neq 1$$

$$10 - 10z = 4z - 4$$

$$-14z = -14$$

$$z = 1$$

$$\emptyset$$

$$(42) \frac{13}{p^2+10} = \frac{2}{p} \quad p \neq 0, \pm\sqrt{10}$$

$$13p = 2p^2 + 20 \quad \{5, 4\}$$

$$0 = 2p^2 - 13p + 20$$

$$0 = (2p - 5)(p - 4)$$

$$p = \frac{5}{2} \quad p = 4$$

$$(43) 4a^4 + 3a^2 - 1 = 0$$

$$\text{let } x = a^2$$

$$4x^2 + 3x - 1 = 0$$

$$(4x - 1)(x + 1) = 0$$

$$x = \frac{1}{4} \quad x = -1$$

$$a^2 = \frac{1}{4} \quad a^2 = -1$$

$$a = \pm \frac{1}{2} \quad a = \pm i$$

$$(44) (2z+3)^{2/3} + (2z+3)^{1/3} = 6$$

$$\text{let } x = (2z+3)^{1/3}$$

$$x^2 + x - 6 = 0$$

$$(x+3)(x-2) = 0$$

$$x = -3 \quad x = 2$$

$$(2z+3)^{1/3} = -3 \quad (2z+3)^{1/3} = 2$$

$$2z+3 = -27 \quad 2z+3 = 8$$

$$2z = -30 \quad 2z = 5$$

$$z = -15 \quad z = \frac{5}{2}$$

$$\left\{ -15, \frac{5}{2} \right\}$$

$$(45) \sqrt{4y-2} = \sqrt{3y+1}$$

$$4y-2 = 3y+1$$

$$y = 3$$

Check

$$\sqrt{12-2} = \sqrt{9+1}$$

$$\sqrt{10} = \sqrt{10} \quad \checkmark$$

$$(46)$$

$$\sqrt{p+2} = 2+p$$

$$p+2 = 4+4p+p^2$$

$$0 = p^2 + 3p + 2$$

$$0 = (p+1)(p+2)$$

$$p = -1 \quad p = -2$$

Check

$$\sqrt{-1+2} = 2-1 \quad \sqrt{-2+2} = 2-2$$

$$1 = 1 \quad \checkmark$$

$$0 = 0 \quad \checkmark$$

$$(47)$$

$$(\sqrt{k})^2 = (\sqrt{k+3} - 1)^2$$

$$k = k+3 - 2\sqrt{k+3} + 1$$

$$2\sqrt{k+3} = 4$$

Check

$$\sqrt{k+3} = 2$$

$$\sqrt{1} = \sqrt{1+3} - 1$$

$$k+3 = 4$$

$$1 = 2-1$$

$$k = 1$$

$$1 = 1 \quad \checkmark$$

$$\{1\}$$

$$(48) \sqrt{x+3} - \sqrt{3x+10} = 1$$

$$\sqrt{x+3} = \sqrt{3x+10} + 1$$

$$x+3 = 3x+10 + 2\sqrt{3x+10} + 1$$

$$-2x-8 = 2\sqrt{3x+10}$$

$$-x-4 = \sqrt{3x+10}$$

$$x^2 + 8x + 16 = 3x + 10$$

$$x^2 + 5x + 6 = 0$$

$$(x+3)(x+2) = 0$$

$$x = -3 \quad x = -2$$

$$\emptyset$$

Check

$$\sqrt{-3+3} - \sqrt{-6+10} = 1$$

$$0 - \sqrt{4} = 1$$

$$-1 \neq 1$$

$$\sqrt{-2+3} - \sqrt{-4+10} = 1$$

$$\sqrt{1} - \sqrt{6} = 1$$

$$1 - \sqrt{6} \neq 1$$

Both check false

$$(49)$$

$$\sqrt[3]{6y+2} = \sqrt[3]{4y}$$

$$6y+2 = 4y$$

$$2y = -2$$

$$y = -1$$

$$(50) [x-2]^{2/3} = x^{1/3}$$

$$(x-2)^2 = x$$

$$x^2 - 4x + 4 = x$$

$$x^2 - 5x + 4 = 0$$

$$(x-4)(x-1) = 0$$

$$x = 4 \quad x = 1$$

$$\{4, 1\}$$

Unit 9 Day 5 Review Continued p342: 73-76

- (73) let p = pressure point in liquid
let d = distance to point

$$p = kd \quad p = 15d$$

$$60 = k(4) \quad p = 15(10)$$

$$15 = k \quad p = 150$$

the pressure is 150 km/m^2

- (74) let f = force needed to stop skidding
let r = radius of curve
let w = weight of car
let s = speed of car

$$f = \frac{Kws^2}{r}$$

$$f = \frac{5ws^2}{6r}$$

$$3000 = \frac{k(2000)(30)^2}{500}$$

$$f = \frac{5(2000)(60)^2}{6(800)}$$

$$1500000 = 1800000k$$

$$\frac{5}{6} = k$$

$$f = 7500$$

7500 lbs of force is needed

- (75) let p = power from windmill
let v = velocity of wind

$$p = Kw^3 \quad p = 10w^3$$

$$10000 = k(10)^3 \quad p = 10(15)^3$$

$$10000 = 1000k \quad p = 10(3375)$$

$$10 = k \quad p = 33750$$

33750 units of power produced

- (76) let w = weight of object
let d = distance from object to center of the earth

$$w = \frac{k}{d^2}$$

$$w = \frac{3686400000}{d^2}$$

$$90 = \frac{k}{6400^2}$$

$$w = \frac{3686400000}{(6400 + 800)^2}$$

$$3686400000 = k \quad w = \frac{3686400000}{(7200)^2}$$

$$w = 71.1 \text{ kg}$$

The man weighs 71.1 kg
800 km above the earth